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Mental Status And Time Of Day In Elderly Nursing Home Residents

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MENTAL STATUS AND TIME OF DAY IN ELDERLY NURSING HOME RESIDENTS

By

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MENTAL STATUS AND TIME OF DAY

IN ELDERLY NURSING HOME

RESIDENTS

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Abstract

The purpose of this quantitative and qualitative descriptive study was to examine the differences in mental status at morning and evening hours of the day among elderly nursing home residents and to describe behaviors and environmental cues associated with changes in mental status. Residents, aged 70 to 90 years who were mobile, were selected from a sample of convenience at a 100-bed rural nursing home in West Central Alabama. A total of 48 residents, 33 females and 15 males, participated in the study.

Demographic data were obtained from the health care records. Mental status of each subject was measured, using Pfeiffer's (1975) Short Portable Mental Status Questionnaire (SPMSQ), twice a day for 3 days during a 3 week period. A description of behaviors and environmental cues associated with changes in mental status also were recorded at each observation.

The hypothesis of this study was that there would be a decline in mental status from the morning hours to the evening hours among elderly nursing home residents. The mean SPMSQ scores for morning and evening were analyzed using the *t* test statistic at the .05 level of confidence. Because the t-value of these scores was not significant, the hypothesis was rejected.

Although not statistically significant, changes in the mental status of some elders were noted during the sequential observations. Although no single pattern of behavior was associated with these changes in mental status, a variety of restless and verbal behaviors were observed, in both morning and evening hours, especially in confused residents. Environmental cues observed with changes in mental status were: dim lighting; absence of calendars and clocks in many rooms; social isolation; lack of meaningful activities; and limited engagement in activities.

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CHAPTER I

The Research Problem

Each evening many residents of nursing homes seem to become agitated, restless, and confused. These behaviors pose tremendous management problems for health care providers. Yet, knowledge of whether these behaviors actually do increase in the evening or just become more noticeable at that time of the day is not available (Evans, 1987). The purpose of this descriptive study was to examine the differences in mental status at morning and and evening hours of the day in elderly nursing home residents and to describe behaviors and environmental cues associated with changes in mental status in these residents.

Introduction to the Problem

The problem of confusion in elderly nursing home residents involves mental status and circadian rhythm. Also, the environment, social interaction, and events must be considered when describing a confusional state (Wolanin & Phillips, 1981). These concepts are discussed in this section.

Elderly Nursing Home Residents

According to the census, the number of elderly people has been increasing steadily. Americans aged 65 years and over

represent about 12% of the population. Between now and the year 2000, elders aged 65 to 74 years will increase by 57%, and those 85 years and over will almost double (Burnside, 1988).

Elders use more service in the health care system than any other age group. They also have a higher incidence of chronic illness and multiple health problems which require nursing care. Because of chronic conditions, elders are a vulnerable and high-risk population (Burnside, 1988).

For many elders, nursing home placement becomes a reality at some point in their lives. Approximately 25% of all Americans will require nursing home care (Burnside, 1988). Data indicate that 5% of all people 65 years and older live in nursing homes. As the number of elders increases, the risk of nursing home placement also will increase (Matteson & McConnell, 1988).

Brody and Foley (1985) described the typical nursing home population as being predominatly white, female, and widowed. The median age for nursing home residents was 81 years. Approximately 93% of nursing home residents required assistance in at least 1 activity of daily living and 25% of the residents were dependent in all 6 activities of daily living (i.e., feeding, dressing, bathing, toileting, continence, and mobility).

Nursing homes that provide care to elders adhere to

specific time schedules, which may not correspond to the biorhythm of elderly persons. Since man's internal biorhythms influence his performance, behavioral responses, and ability to adapt, a decline in mental status might result (Ebersole & Hess, 1985).

Mental Status of Elders

All declines in mental status and confusion are not the same. The degree of a confusional state can vary from mild to severe (Wolanin & Phillips, 1981). A wide variety of changes in mental status have been noted in elderly persons. Memory loss, disorientation, agitation, disruptive behavior, and restlessness are common (Hogstel, 1979). Often, these changes are generalized and referred to as confusion. Young people who show signs of mental deterioration are considered ill and in need of help. However, older persons who act in this way are often labeled as senile and beyond help (Hogstel, 1979).

The quality of life and ability of an individual to function as an integrated whole is altered when mental status declines (Matteson & McConnell, 1988). An estimated 50 to 70% of institutionalized elders have some form of cognitive or affective impairment (Butler & Lewis, 1981). An estimated 4,000,000 elders are mentally impaired, at least moderately to severely, and are unable to care for themselves. Yet, the

understanding of mental impairment in the elderly still is limited (Wolanin, 1983).

Circadian Rhythm and Changes in Mental Status

The basic functions of the body change throughout the course of the day. The existence in humans of 24 hour or circadian rhythms has been verified (Dubos, 1973). These rhythmic activities include: blood levels of eosinophils, sugar, iron, and corticosterone; urine excretion; intraocular pressure; body temperature; and sleep patterns (Dubos, 1973).

The circadian cycle does not change with age and the presence of regular circadian rhythms indicates normal health status (Davis & Lentz, 1989). Very little study has involved the relationship between circadian rhythm and mental status in humans. However, at nightfall certain elderly residents in nursing homes are noted to deteriorate mentally (Roller, 1988). Clinicians refer to this phenomenon as the sundown syndrome Wolanin & Phillips, 1981).

The syndrome gets its name because the confusion and disorientation become more noticeable after the sun goes down. Little research is in the literature about this syndrome, but both nursing home staff and relatives caring for elders at home have described it (Burnside, 1988).

Evans (1987) postulated that circadian rhythm desynchrony could be a facilitating factor in sundowning. Whereas, blood

pressure and body temperature rise during the day and peak in the late afternoon in normal circadian rhythms, the mean increase in blood pressure and temperature was less for elders with sundowners.

The findings of Cameron (1941) indicated that the manifestations of sundowner's syndrome occurred in relation to sensory deprivation. When the environment did not offer stimulation, elders experienced irritability, restlessness, inabilty to think clearly, and perceptual distortion. For optimal stimulation of elders, special environmental needs might include: adequate light without glare, bright and varied colors, contrasts, interesting pictures, purposeful television and radio, calendars, clocks, and demarcation of day and night. Visual and hearing impairments in elders can lead to distortions or sensory deprivation and should be assessed by caregivers. Monotony, due to a static environment in the nursing home, also can lead to sensory deprivation (Burnside, 1988).

Another possible explanation for sundown syndrome is sensory overload. A physical environment that is over stimulating with noise, glare, and activity can disturb perception. The persistent barrage of input produces symptoms similar to those of sensory deprivation. Sensory overload can occur in a nursing home when a resident is first admitted and

unfamilar with the sounds, lights, staff, and schedules of the facility (Burnside, 1988). A recent room change, roommate change, or relocation to a nursing home also can cause sensory overload (Evans, 1987).

Significance of the Study

The dramatic current and projected increase of elders has stimulated health professionals to devote increasing attention to aging and the aged. The high prevalence of chronic conditions, multiple problems, and cognitive impairment among nursing home residents challenges nurses to identify and meet the complex needs of this population.

Mental status is of concern to nursing in the diagnosis and treatment of human responses to actual or potential health problems (American Nurses' Association (ANA), 1980). The American Nurses' Association (1987) identified standards of practice in order for gerontological nurses to provide high quality care. One identified standard included an accurate, comprehensive assessment of the older person. Since the primary needs of a confused resident are nursing needs, the nurse needs to assess confusional states (Hayter, 1981). The nurse is challenged to detect subtle changes through accurate assessment (Bartol, 1983). With early detection of changes, the nurse can determine when declines in mental status may occur and thus prevent or minimize maladaption.

Through accurate assessment data, the nurse is able to identify relevant nursing diagnoses which are congruent with the older person's health status. Nursing diagnoses guide the nurse in planning, intervening, and evaluating the written plan of care (ANA, 1987). Nurses, after developing a plan of care, should be able to intervene, prevent, or minimize complications occuring from declines in mental status (Wolanin & Phillips, 1981). Keeping mental faculties at an optimal level is important since it has been shown that people who are allowed to decline mentally also decline physically (Nodhurft & Sweeney, 1982).

The management of institutionalized elders with cognitive impairments is primarily the responsibility of the nurse. The care is time consuming and requires the utmost patience. In order to intervene appropriately, the nurse needs to be aware of when declines in mental status may occur and which preciptating factors may be involved.

Theoretical Framework

The theoretical framework for this study was the Roy Adaptation Model (1980). The Roy model consists of five major elements: person, goal of nursing, nursing activities, health, and environment.

Persons, as living systems, are in constant interaction with their environment (Roy, 1980). The person is described as

a biopsychosocial being which means that each person has a biological component, such as his anatomy and physiology. At the same time the person also has a psychological nature which interacts with the nervous system to produce meaningful behavior. Lastly, the person is a social being and interacts with others. For the purpose of this study, person was limited to elderly nursing home residents who are aged 70 to 90 years and are mobile.

According to Roy (1980), the goal of nursing is to promote adaptation by the use of the nursing process in each of the adaptive modes, thus contributing to health, quality of life, or dying with dignity. This study assessed the factor of time in relation to its effect on mental status. With the information gained from this study, nursing interventions can be identified to eliminate, reduce, or manage stimuli in promoting adaptive behavior. Nurses then can evaluate the intervention outcomes and judge whether they are effective in reaching the goal (Roy, 1980).

With regard to nursing activities, nurses act by manipulating the stimuli impinging on the person to promote adaptive behavior. A person is faced with three types of stimuli: (a) focal stimuli, those stimuli immediately confronting the person; (b) contexual stimuli, all other stimuli present; and (c) residual stimuli, such as beliefs,

attitudes, or traits (Roy, 1980). For this study, the stimuli identified include: age, preexisting medical conditions, biorhythms, medications, decreased hearing and vision, environmental cues and activities, time, and educational level. The focal stimulus for this study was time. The contexual stimuli for this study included: age, preexisting medical conditions, biorhythms, medications, decreased hearing and vision, and educational level. The residual stimuli included: beliefs, attitudes, and previous experiences.

In order for individuals to be able to function in their environment, they must be able to interpret incoming stimuli so that they become meaningful information. Too many or too few stimuli may lead to thought disorganization and confusion (Roy, 1976). The focal stimulus for this study is time which also would include sensory input at that given time. Sensory input varies in both amount and predictability. It can be described on a continuum from absolute reduction, or sensory deprivation, to an increase in sensory stimulation to the extreme, or sensory overload. Since continuous sensory input is necessary for adaptive behavior, problems occur whenever a person receives cues at either end of the continum (Roy, 1976).

Health was defined by Roy (1976) as a state of being or becoming an integrated and whole person. Health is a dynamic state of being that, for each person, moves back and forth on a

continuum, commonly called the health-illness continuum. As persons move along the continuum, they encounter adaptation problems. These problems are the primary concern of the nurse (Roy, 1976).

Cognitive impairment and resultant problems affect over half of nursing home residents (Bulter & Lewis, 1981). Cognitive impairment limits the elders ability to communicate health needs effectively. Besides the expression of needs, cognitive impairment also jeopardizes self-care abilities (Burnside, 1988). These impairments can result in maladaptation and may require nursing intervention to promote health and adaptation.

According to Roy (1980), the environment is the collection of persons, places, and objects which occupy the physical space of the adapting person. The adapting person and the environment come together constantly.

The environment of this study was the nursing home. Conditions in the facility, such as unfamilar surroundings, numerous staff members, and different routines, can result in the elder's cognitive decline. Relocation to a nursing home or even a room change within a nursing home challenges the elder's ability to adapt. Not only is the new environment unfamilar, but the relocation often signifies the loss of one's home,

personal belongings, independence, and social network (Matteson & McConnell, 1988).

According to Roy (1976), major adaptive problems that fall within the realm of nursing assessment and intervention include: altered sensation, sensory deprivation, and sensory overload. The conditions in a nursing home can cause either sensory deprivation or sensory overload. Behavioral responses to sensory deprivation or overload include: restlessness, irritability, boredom, and mental confusion (Roy, 1976).

In summary, this study tested Roy's theory through the assessment of the effects of stimuli on mental status in elderly nursing home residents. The data obtained was utilized to determine if sensory input at a given time can cause declines in mental status. The results of this study may be utilized to identify when nursing interventions are needed to eliminate, reduce, or manage stimuli in order to promote adaptive behavior.

Statement of the Problem

Over half of institutionalized elders have some form of cognitive or affective impairment and are unable to care for themselves. Yet, the understanding of mental impairment in the elderly is limited (Wolanin, 1983).

The primary problem of this study was: Is there a difference in mental status at morning and evening hours of the

day in elderly nursing home residents? The secondary problem was: What are the behaviors and environmental cues associated with changes in mental status in these elderly nursing home residents?

Hypothesis and Qualitative Research Question

The hypothesis of this study was: There will be a decline in mental status from the morning hours to the evening hours among elderly nursing home residents.

The qualitative research question was: What are the behaviors and environmental cues associated with changes in mental status in these residents?

Assumptions

The assumptions which underlie this study were as follows:

1. Each person possesses an internal biological clock or circadian rhythm.
2. Mental status changes and can be measured.
3. Mental status is an adaptive response to stimuli.

Definitions of Terms

For the purpose of this study, terms used were defined in the following manner:

Mental Status

Mental status is a level of awareness which can vary from a state of alertness to one of confusion.

Time of Day

Time of day is a particular interval of time during a 24 hour day, specifically, either morning or evening.

Morning. Morning is the interval of time after 12 a.m. and before 12 p.m. In this study, morning was limited to the time between 8 a.m. and 10 a.m.

Evening. Evening is the interval of time after 12 p.m. and before 12 a.m. In this study, evening was limited to the time between 6 p.m. and 8 p.m.

Behavior

Behavior is the conduct of a person which is externally observed.

Environmental Cues

Environmental cues are the conditions and elements that make up the surroundings and influence the person.

Elderly Nursing Home Residents

Elderly nursing home residents are persons aged 70 to 90 years who are mobile by means of ambulation or wheelchair, assisted or unassisted.

Summary

Although data indicate a high prevalence of mental impairment in elders and research supports the existence of sundown syndrome, no studies have been conducted to assess the mental status of elders in nursing homes at different times of

the day. Thus, the purpose of this study was to examine the differences in mental status at morning and evening hours of the day in elderly nursing home residents and to describe behaviors and environmental cues associated with changes in mental status in these residents.

Chapter II includes a review of literature and a summary of studies which have examined simultaneously the variables of mental status and time of day. In Chapter III the design of the study is described. The findings and outcomes of data analysis are presented in Chapter IV. In Chapter V the outcomes in relation to the hypothesis, implications of the study to nursing, and recommendations for future research are discussed.

CHAPTER II

Review of Literature

Today, despite the prevalence of research on aging, few studies on impaired mental function can be applied clinically. Yet, over 4,000,000 elders are mentally impaired and unable to care for themselves (Wolanin, 1983). A review of recent literature identified only three studies which simultaneously examined the variables of mental status and time of day. These studies are summarized in this chapter.

An early study of senile nocturnal delirium was conducted by Cameron in 1941. The purpose of the study was to determine whether darkness was a major causative factor of the delirium rather than an accumulation of fatigue during the day. The sample included 16 elders. The age range of subjects was not given. Each elder was put in a dark room during the earlier part of the day. Through common observation, the delirium was noted to appear within an hour after the elder was put in the dark room. This restless, confused behavior subsided in about an hour after the elder was brought back into the light. Another finding indicated that the delirium appeared earlier and was more marked in elders in whom it was most severe during the evening hours. These results clearly emphasized the importance of darkness as a causative factor of delirium.

Further investigation by Cameron (1941) showed that elders known to exhibit nocturnal delirium also suffered from marked impairment of recent memory. The procedure for this study involved seating the elder in his room and asking him to point out the location of five common objects within view. This naming was done first with the eyes open and then repeated every 15 minutes with the elder blindfolded. In all but 3 of the 16 elders, definite displacement of objects occurred within 15 minutes after observation of it. This impairment of recent memory affected the elder's capacity to orient themselves.

Based on Cameron's findings (1941), regressed elders should not be placed in a dark room during the daytime hours and movies should not be shown during the daytime. Adequate lighting should be provided since darkness tends to trigger agitation, restlessness, and disorientation.

In 1987, Evans conducted an exploratory study to describe sundown syndrome, to examine its prevalence in nursing home residents, and to identify causative factors. A total of 89 nursing home residents, 59 demented and 30 nondemented, aged 60 years and above were randomly selected from the 140 eligible residents. Residents were observed in the morning and the evening hours over 2 consecutive days using a Confusion Inventory Scale. In addition, Pfeiffer's (1975) Short Portable Mental Status Questionnaire (SPMSQ), the Philadelphia

Geriatric Center Morale Scale, the Face-Hand test, demographic data sheet, and sensory screening were completed.

To identify sundowners, the scores for all 48 behaviors on the Confusion Inventory Scale were summed and a mean sundown score was calculated for the 2 days. A total of 11 sundown elders representing 12.4% of the nursing home population were identified. Approximately 82% of the sundowner elders identified were from the demented group of elders.

Although no clear pattern of behavior emerged, residents with sundowners demonstrated a variety of increased restless and verbal behaviors. Demented elders, that is, those with greater mental impairment and organic involvement, were more than twice as likely to experience sundown syndrome. The sundowner elders were observed to be socially isolated, had few visitors, and engaged in few activities in the afternoon. A majority of these elders were observed to be in dim lighted areas in the afternoon. Physical restraints were used on 8 of the 11 elders. Also, an odor of urine was noted in the evening but not in the morning.

The sundowner elders scored higher, noting a greater impairment, on the SPMSQ and over 65% failed the Face-Hand test. No relationship between morale and sundowning was found. Approximately 50% of sundowner elders had been in their rooms

less than 1 month, as compared to 18% of nonsundowner elders. This was a significant difference.

Evans (1987) suggested that an environment lacking adequate stimulation can cause an increase in restlessness, irritability, and agitation. Evans (1987) also suggested that mentally impaired elders may have trouble in adapting to a new environment after a recent room change or relocation to a nursing home.

Evans (1987) postulated that circadian rhythm desynchrony could be a facilitating factor in sundowning. Whereas, blood pressure and body temperature rise during the day and peak in the late afternoon in normal circadian rhythms, in this study, the mean increase in blood pressure and temperature was less for sundowners than for nonsundowners.

Evans (1987) study supported the existence of sundown syndrome in elderly nursing home residents. Clearly, mental impairment placed the elderly residents at a greater risk for developing the syndrome. The loss of social cues upon admission to a nursing home and low environmental light may create rhythm desynchrony and result in sundowning.

In summary, information concerning the mental deterioration of elderly residents at nightfall is limited and no reliable data concerning the possible etiology were

available (Wolanin & Phillips, 1981). More research is needed to determine patterns of behavior and precipitating or predisposing factors.

This study assessed the mental status of elderly nursing home residents in the morning and evening hours to determine if there were notable declines at night. A description of behaviors and environmental cues also were recorded at the time of mental status assessment to identify patterns of behavior and possible precipitating factors.

CHAPTER III

Research Method

The purpose of this descriptive study was to examine the differences in mental status at morning and evening hours of the day in elderly nursing home residents and to describe behaviors and environmental cues associated with changes in mental status in these residents.

Design of the Study

The study employed was a non-experimental, quantitative and qualitative descriptive design. The purpose of a descriptive design is to gain more information about phenomenon and to identify problems with current practice. Careful analysis of the data collected may reveal relevant factors or relationships between variables studied and the identified problem (Burns & Grove, 1987).

The phenomenon of interest in this study was changes in mental status, especially changes associated with sundown syndrome. Little is known about the phenomenon itself, precipitating factors, or preventive measures (Evans, 1987). This study assessed mental status in the morning and evening hours on 3 different days during a 3 week period. Also, a description of behaviors and environmental cues associated with changes in mental status were recorded to determine patterns in behavior and precipitating factors.

Variables, Null Hypothesis, and Qualitative Research Question

The dependent variable in this study was mental status. The independent variables were time of day and related environmental cues and activities. Intervening variables considered in analysis of data were: (a) age, (b) medications received, (c) preexisting medical conditions, (d) presence of hearing or visual impairments, and (e) educational level.

The null hypothesis was: There will be no significant differences in mental status at morning and evening hours of the day among elderly nursing home residents.

The qualitative research question was: What are the behaviors and environmental cues associated with changes in mental status?

Setting and Sample

The population of this study was elderly nursing home residents living in a 100-bed rural nursing home in West Central Alabama. The sample of convenience included 51 of these residents who were between 70 and 90 years of age and were mobile. All males and females, who fit the stated criteria, were invited to participate in the study.

Initial consent for this study was obtained from the Committee on Use of Human Subjects in Experimentation at Mississippi University for Women The Administrator of the

nursing home was contacted (see Appendix A), and permission to conduct the study was obtained in writing (see Appendix B). The project also was discussed with Medical Medical Director of the nursing home and a meeting was held with the Director of Nursing Service to explain the data gathering process and to establish the time frame for obtaining volunteer subjects

With regard to selection of the sample, potential subjects were approached to explain the study and to request volunteers to sign an informed consent form (see Appendix C). Because of the inclusion of confused residents, the Director of Nursing Service helped to determine whether the resident was capable of understanding the study and signing his own name on the consent form. If the resident could not understand or sign his name, the signature of the nearest relative or legal guardian was obtained.

Collection of Data

Procedure

Data were collected over a 3 week period in June of 1989. Data regarding medical diagnoses, medications, age, sex, race , length of residence, and education were obtained from health care records. With assistance from staff, mobility, visual and hearing acuity, and activities of daily living (i.e., eating, dressing, bathing, toileting, continence, and transfers) were assessed by observation.

Prior to assessing mental status, the 48 subjects were divided into 3 groups. Data were collected from each group of 16 subjects 1 day each week for a 3 week period. During a timed 8 minute interval, the SPMSQ was orally administered in the morning, between 8 a.m. and 10 a.m., and in the evening, between 6 p.m. and 8 p.m., to assess mental status. At this time, behaviors and environmental cues also were observed and recorded.

Instrumentation

Pfeiffer's (1975) Short Portable Mental Status Questionaire (SPMSQ) was utilized for data collection. The instrument consisted of 10 questions testing remote memory, awareness of current events, and mathematical ability. The advantage of conducting the assessments within the framework of this structured instrument was that the findings can be compared with findings on other elders by other clinicians.

The validity of the SPMSQ was tested by administering the tool to 2 non-random populations of elderly, 141 elderly clinic patients and 102 elderly institutional patients (Pfieffer, 1975). The distribution of error scores of the 2 groups served to give face validity to the SPMSQ as a measure of organic impairment. Two additional studies were undertaken by comparing the total error score on the SPMSQ with the clinical diagnosis of the 133 and 80 subjects (Pfeiffer, 1975). Data

revealed a 92% and a 88% agreement, respectively, between the SPMSQ and the clinical diagnosis of Organic Brain Syndrome.

To establish reliability, two groups of elderly subjects (N=30; N=29) were given the SPMSQ twice at 4 week intervals to determine stability of response. The findings indicated no significant practice effect or deterioration in performance over this length of time (Pfeiffer, 1975). The SPMSQ has been used extensively in elderly with established reliability (Matteson & McConnell, 1988).

Each activity of daily living was scored on a scale of 0 (independent), 1 (partially dependent), and 2 (dependent). A total score for activities of daily living (ADL) then was calculated by adding each individual score. Finally, the ADL scores were categorized as follows: (a) independent, score of 0-2; (b) partially dependent, score of 3-6; and (c) dependent, score of 7-12 (see Appendix D).

A supplemental information form also was used to obtain demographic data and record observations (see Appendix D). This form was developed by the researcher and was used only for descriptive data, therefore, reliability was not a factor.

Pilot Study

This study included a pilot study to determine strengths and weaknesses of the research design, that is, sample

selection, appropriateness of the data collection instruments, and procedures. The pilot study was conducted on a convenience sample of 10 elderly residents in a separate rural nursing home. The resident's mental status was assessed, utilizing the SPMSQ, twice a day for 3 days.

No significant difference in mental status between morning and evening SPMSQ scores were noted. However, increased restless and verbal behaviors were observed among those subjects with moderate to severe mental impairment. Environmental factors of inadequate lighting and social isolation, also were observed. Based on this pilot study, the following changes were made in the study design: (a) addition of a qualitative descriptive design to the quantitative design, and (b) observation and recording of behaviors and environmental cues at the time of mental status assessment.

Analysis of Data

The quanitative data, the morning and evening SPMSQ scores and the demographic variables, were analyzed using the *t* test. The *t* test is a common parametric analysis used to test for significant differences between statistical measures. For the *t* test, the standard deviation of the sample is used to estimate the standard error of the sampling distribution (Burns & Grove, 1987). The qualitative data were analyzed on the

basis of frequency distributions of the behaviors and environmental cues recorded.

CHAPTER IV

ANALYSIS OF DATA

The purpose of this quantitative and qualitative descriptive study was to examine the differences in mental status at morning and evening hours of the day among elderly nursing home residents and to describe behaviors and environmental cues associated with changes in mental status in these residents. Data were collected from 48 residents in a 100-bed, rural nursing home. The mental status of each subject was measured, using Pfeiffer's (1975) Short Portable Mental Status Questionnaire (SPMSQ), twice for 3 days during a 3 week period.

Quantitative Findings

The quantitative data, the morning and evening SPMSQ scores and the demographic variables, were analyzed using the *t* test statistic. The results of analysis are presented in the following section.

Description of Sample

A total of 52 residents met the criteria for this study with 48 residents agreeing to participate. The group consisted of 35% black black females, 33% white females, 17% white males, and 15% black males. Ages of the participants ranged from 70

to 90 years with a mean age of 82 years. The educational level ranged from 0 to 16 years with a mean of 7.7 years. Length of residence in the nursing home ranged from 3 months to 10 years with a mean length of 13 months.

Of the total sample, 52% were ambulatory, 48% were wheelchair dependent, and 42% were totally dependent on staff for mobility. With regard to visual and hearing impairment, 33 participants had visual impairment, 28 having mild to moderate impairment and 5 having severe impairment. Twenty-four participants had hearing impairment, 22 having mild to moderate impairment and 2 having severe impairment.

All participants attended some type of activity daily with only 12 participants having minimal attendance. With regard to activities of daily living (ADL), 19 participants were totally dependent and 10 were partially dependent. Participants had an average of 3 medical diagnoses and took 5 prescribed medications. Approximately 48% of the participants were diagnosed with Organic Brain Syndrome.

The mean score on the SPMSQ was 5.1 in the morning and 5.2 in the evening. Raw data for the sample can be found in Appendix F. A description of the sample can be found in Table 1.

Hypothesis

The hypothesis for this study was that there would be a decline in mental status from morning hours to evening hours of

Table 1

Description of Sample of Elderly Nursing Home Residents*

Variable	Results	
Age (mean)	82 years	
Length of Residence (mean)	13 months	
Educational Level (mean)	7.7 years	
SPMSQ Score (mean)		
morning	5.1	
evening	5.2	
Sex/Race	black	white
female	17	16
male	7	8
Mobility		
ambulatory	25	
wheelchair	23	
Visual/Hearing Impairment	moderate	severe
visual	28	5
hearing	22	2
ADL Dependence	29	
partial	10	
total	19	

*N=48

the day among elderly nursing home residents. To test this hypothesis, a *t* test analysis was performed using a .05 level of confidence. The value for the mean SPMSQ scores in the morning and evening hours was $t(47)=1.066$, $p=.146$ (see Table 2). Since there were no significant differences in the morning and evening mean SPMSQ scores of elderly nursing home residents, the hypothesis was rejected.

Additional Findings

Several observations were made which were not related to the research hypothesis, but of interest for the qualitative research question. Although there were no significant differences in mental status at morning and evening hours of the day, changes in the mental status of some elders were found during the sequential observations. To examine the data further, *t* tests were used to determine if differences occurred among age, sex, and race of the elders. No significant differences were found with age or sex. When black and white SPMSQ scores were analyzed using the *t* test, a statistically significant difference at the .05 level of confidence was found. A comparison of these groups is presented in Table 3.

In considering the differences between black and white mean SPMSQ scores, a wide range of difficulty among the 10 items on the instrument was noted. The most difficult item, calculation of serial 3's, was failed by 47 of the participants

Table 2

Comparison of Morning and Evening SPMSQ Scores of Elderly Nursing Home Residents Using the t Test

Item	N	M	SD	t
SPMSQ AM	48	5.119	2.710	1.066
SPMSQ PM	48	5.169	2.745	

p=.146

and the easiest, mother's name, was missed by only 1 of the participants. The number of participants failing each of the 10 items on the questionnaire is presented in Table 4. Also presented in Table 4 are the number of black and white participants, respectively, failing each item. As noted, blacks had consistently higher failure rates than whites on all SPMSQ items.

Qualitative Findings

Moderate to severe mental impairment was noted in 54% of the participants. Approximately 62% of this group had a diagnosis of Organic Brain Syndrome. Participants with impaired mental status scores, that is, SPMSQ scores between 5 and 10, exhibited a variety of behaviors. Such behaviors included: wandering, rocking, picking at clothes, screaming, crying, singing, calling for help, and searching. These

Table 3

Comparison of SPMSQ Scores of Black and White Elderly Nursing Home Residents Using the t Test

Group	N	M	SD	t
Black	24	5.5460	2.9440	-1.9323*
White	24	3.970	2.6335	

*p=.0314

restless behaviors were noted both in the morning and evening hours.

For those participants who were in their rooms during morning and evening observations, the room lights were not turned on 48% of the time; consequently the rooms were dimly illuminated. Approximately 33% of the rooms did not have visual cues such as calendars and clocks. When clocks were present in the rooms, none had large numerals. Approximately 33% of the subjects were sitting alone with no social or environmental stimulation. A total of 35% of participants voiced disinterest in the activities occurring in the nursing home. In responding to current event questions on the SPMSQ, 42% of participants voiced disinterest and irrelevance.

Table 4

Comparison of Difficulty of SPMSQ Items and Race of Elderly Nursing Home Residents

Item #	Description	Number Failing Item		
		All (N=48)	Black (N=24)	White (N=24)
10	serial 3's	47	24	23
1	date	38	21	17
7	present president	37	22	15
8	previous president	35	22	14
2	day	24	16	8
6	birthdate	24	15	9
5	age	19	12	7
3	place	17	11	6
4	location	16	13	3
9	mother's name	1	1	0

CHAPTER V

Summary, Conclusions, Implications, and Recommendations

The purpose of this quantitative and qualitative descriptive study was to examine the differences in mental status at morning and evening hours of the day among elderly nursing home residents and to describe behaviors and environmental cues associated with changes in mental status in these residents. The summary, conclusions, implications, and recommendations are found in this section.

Summary of Findings

A total of 48 subjects, aged 70 to 90 years, in a 100-bed rural nursing home participated in the study. Mental status of each subject was measured, using Pfeiffer's (1975) Short Portable Mental Status Questionnaire, twice a day for 3 days during at 3 week period. Observation of behaviors and environmental cues also were recorded at the time of mental status assessment.

The hypothesis of this study was that there would be a decline in mental status from morning to evening hours of the day among elderly nursing home residents. The mean SPMSQ scores for morning and evening were analyzed using the t test statistic with a significance level of .05. Because the t-

value of these mean scores was not significant, the hypothesis was rejected. Although not statistically significant, changes in the mental status of some elders were noted during the sequential observations. Moderate to severe mental impairment at every testing was noted in 54% of the participants.

No single pattern of behavior was associated with changes in mental status. A variety of restless and verbal behaviors were observed, in both the morning and evening hours, especially in confused residents. Environmental cues, possibly affecting mental status, observed included: dim lighting; absence of calendars and clocks in many rooms; social isolation; lack of meaningful activities; and limited engagement in activities.

Discussion and Implications

The data collected failed to show a significant difference in the institutionalized elder's mental status or behavior during the morning and evening hours. This finding does not support other studies (Cameron, 1941; Evans, 1987) which indicated that mental status declines in the evening hours. However, several factors may have influenced the outcome of this study. Low environmental light was observed in both the morning and evening hours and this factor has been noted as a precipitating factor in sundown syndrome or increased restless behaviors (Cameron, 1941).

The limited number of social contacts, meaningful activities, environmental cues, and visual, auditory, and other stimuli in the environment nursing home environment may have influenced mental status at all time intervals. These observations support the findings in the literature regarding environmental effects on mental status (Burnside, 1988; Cameron, 1941; Ebersole & Hess, 1988; Evans, 1987; Wolanin & Phillips, 1981).

Relocation and a new environment are factors which have been noted to increase sundown syndrome and confusion (Burnside, 1988; Evans, 1987; Wolanin & Phillips, 1981). In this study, the length of residence varied from 3 months to 10 years with a mean length of residence of 13 months. Since no residents had relocated recently to the nursing home, relocation effect probably did not influence the SPMSQ scores.

A total of 50% of the residents in this sample were black and 50% were white. This sample differed from the nursing home population nationally in the disproportionate representation of blacks. When black and white SPMSQ scores were analyzed using the _t_ test, a significant difference was found. Also, blacks had consistently higher failure rates than whites on all SPMSQ items. The mean educational level for blacks in this sample was 3.9 years in comparison to 7.7 years for the total sample.

Therefore, this finding could be a result of the lower educational levels reported by the majority of blacks in this study.

Emphasized in Roy's Adaptation Theory (1980) was the need for continuous meaningful sensory input to promote adaptive behavior. Too many or too few stimuli may lead to thought disorganization and confusion. In promoting adaptive behavior in nursing home residents, it is important for the nurse to provide appropriate, meaningful stimuli in the environment. Special environmental needs might include: adequate light without glare, bright and varied colors, interesting pictures, calendars, clocks with large numbers, purposeful television, radio programing, newspapers, and meaningful social activities (Burnside, 1988).

The high incidence of impaired mental status noted at all time intervals indicated the need for ongoing assessment of residents to plan nursing care and manage problems associated with confusion. Gerontological Nurse Clinicians need to be increasingly committed to furthering the understanding of confusional states. Patterns of behavior, precipitating factors, and the effects of nursing care need to be examined systematically .

Recommendations for Further Study

Based upon the findings of this study, the following recommendations were made:

Research

1. Replication of the study utilizing a larger sample size, randomly selected.

2. Replication of the study with elders from nursing homes covering a broader geographic area than West Central Alabama.

3. Replication of the study in the home environment.

4. Conduction of a 6 month longitudinal study to observe and measure differences in mental status of elders over a longer period of time.

5. Utilization of more sensitive, culturally unbiased instrument to measure changes in mental status, especially confusion.

Nursing

1. Assessment of mental status of elderly residents on admission to serve as a baseline for ongoing assessment.

2. Education of all nursing home staff in factors which precipitate confusion and measures to prevent and manage confusion in residents.

3. Promotion of meaningful activities, positive stimuli, and orientation cues in the nursing home environment.

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APPENDICES

APPENDIX A

December 12, 1988

Lowry Rush, III
Sumter Nursing Home
York, AL

Dear Mr. Rush:

In fullfillment of the requirements for a master's degree in nursing from the Mississippi University for Women, I am conducting a research study to compare the differences in mental status and time of day among nursing home residents. The results of this study will help the nurse to predict when confusion is most likely to occur in residents.

I would appreciate the opportunity of obtaining the subjects for the study from the residents at Sumter Nursing Home. Criteria for participation in the study include: the resident be 70 to 90 years in age and mobile. The study will be conducted only among those residents volunteering to participate.

I would like to meet with you at your earliest convenience to discuss the details of the study. Thank you for your consideration of my request.

Sincerely,

Lynn S. Lashley

cc: Dr. Eleanor Eller
Clara Jean Stallings

APPENDIX B

Agency's Agreement Form

Concerning Nursing Study

TITLE OF STUDY: Mental Status and Time of day in Nursing Home Residents

NAME OF AGENCY: Sumter Nursing Home

NAME OF INVESTIGATOR: Lynn S. Lashley, R.N.

STUDY DISCUSSED AND EXPLAINED TO:

(1) Lowry Rush, III
Administrator

(2) Dr. Eleanor Eller
Medical Director

(3) Clara Jean Stallings
Director of Nursing Service

AGENCY INVOLVEMENT IN STUDY:

Consent for resident to participate in the study on a voluntary basis.

_____ _____

Date Agency Representative

_____ _____

Witness Investigator

APPENDIX C

INVITATION TO PARTICIPATE

Dear Resident,

I am Lynn Lashley, a registered nurse and a graduate student at Mississippi University for Women. I am conducting a research study to better understand older person's functioning at various times of the day in nursing homes. This information may be used by nurses to plan nursing care more effectively.

I am asking you to help me voluntarily with this study. If you agree to participate, you will be asked a series of ten questions about the time and place. These questions will be asked twice a day on three different days.

All information about you will be kept private and your name will not appear on the forms or in the study. You may withdraw from the study at any time prior to completing the last questions. Withdrawal from the study would not alter or jeopardize your nursing care.

If you have any questions about this study, I can be reached at 652-2301.

Sincerely,

Lynn S. Lashley
Researcher

I understand the explanation given to me and agree to participate in this study.

_____ Date_____
resident

_____ Date_____
witness

APPENDIX D

DATA AND SCORE SHEET FOR PARTICIPANTS

Initials___
Code#___Rm#___
Sex___Race___
DOB___Age___
Education___Adm___
Med Dx: #___
OBS/dementia___
respiratory___
cardiac/CVD___
renal___
fracture___
diabetes/endocrine___

Mobility: ambul__ w/c__
asst__unasst__device__
Activities_____
Routine meds: #__
hypnotic/sedative___
tranquilizer___
antidepressant___
antihypertensive___
cardiac___
diuretic___
analgesic___
other___

Activities of Daily Living Total Score____
(Independent 0; Part Dependent 1; Tot Dependent 2)

Eating____
Bathing____
Continence____

Dressing____
Toileting____
Transfers____

SHORT PORTABLE MENTAL STATUS QUESTIONNAIRE

	day 1		day 2		day 3	
	am	pm	am	pm	am	pm
What is the date today?_____	__	__	__	__	__	__
What day of the week is it?_____	__	__	__	__	__	__
What is the name of this place?_____	__	__	__	__	__	__
What is the location of this place?___	__	__	__	__	__	__
How old are you?_____	__	__	__	__	__	__
When were you born?_____	__	__	__	__	__	__
Who is the pres. of the U.S. now?_____	__	__	__	__	__	__
Who was president just before him?____	__	__	__	__	__	__
What was your mother's maiden name?___	__	__	__	__	__	__
Subtract 3 from 20 and keep subtracting 3 from each new number, all the way down (20-17-14-11-8-5-2)_____	__	__	__	__	__	__
Total number of errors	__	__	__	__	__	__
date	_____		_____		_____	
time	__	__	__	__	__	__
setting	__	__	__	__	__	__
odor of urine	__	__	__	__	__	__
behavior noted						

APPENDIX E

Raw Data

ID	AGE	RACE	SEX	EDUC	LOR	MOB	ADL	VI	HI	#MED	OBS	SPMSQ	
												am	pm
1	85	B	F	NA	48m	A	P	S	S	4	Y	9	9
2	89	B	F	NA	40m	A	P	N	S	2	Y	8	8
3	84	B	F	NA	6m	A	I	S	S	3	Y	8	8
4	81	W	M	NA	13m	WC	D	S	S	8	Y	8	8
5	85	B	F	0	18m	WC	D	N	N	7	Y	10	10
6	78	W	M	16	5m	WC	D	S	S	6	Y	7	7.2
7	78	B	F	12	16m	A	I	S	S	3	N	1.1	1.1
8	86	W	F	8	73m	A	P	S	SV	10	N	4.1	4
9	90	B	F	3	34m	A	I	S	N	5	Y	3.2	3.2
10	77	W	M	9	73m	A	I	N	N	2	N	4	4
11	74	W	M	10	15m	A	I	N	N	0	N	2	2
12	76	W	F	12	3m	WC	D	S	S	6	N	3.1	3.1

ID=identification number
EDUC=educational level in years, NA=not available
LOR=length of residence in months
MOB=mobility status, A=ambulatory, WC=wheelchair
ADL=activities of daily living dependence, I=independent, D=dependent, P=partial
VI=visual impairment, S=some, N=none, SV=severe
HI=hearing impairment, S=some, N=none, SV=severe
#MEDS=number of medications receiving
OBS=organic brain syndrome diagnosis, Y=yes, N=no

Raw Data Continued

ID	AGE	RACE	SEX	EDUC	LOR	MOB	ADL	VI	HI	MED	OBS	SPMSQ am	SPMSQ pm
13	78	W	F	10	17m	A	I	S	S	9	N	1	1
14	84	B	M	3	8m	WC	P	N	S	6	Y	7.2	7.2
15	78	B	M	3	3m	A	P	SV	N	7	N	4.2	4.2
16	83	B	M	3	26m	WC	D	S	S	5	N	7.2	7.2
17	77	B	M	3	20m	WC	P	N	N	5	N	4.2	4.2
18	88	B	F	8	6m	WC	D	S	N	3	N	3	3
19	75	B	F	5	126m	A	I	N	N	4	N	4.2	4.2
20	72	B	F	NA	5m	WC	D	S	N	9	N	8	8
21	87	B	M	NA	5m	WC	P	N	N	6	N	9	9
22	78	W	F	16	6m	WC	P	S	N	8	Y	6.2	7
23	82	B	F	NA	28m	A	I	N	N	5	Y	8	8
24	86	W	F	7	40m	A	I	S	S	8	N	1	1.2

ID=identification number
EDUC=education in years, NA=not available
LOR=length of residence in months
MOB=mobility status, A=ambulatory, WC=wheelchair
ADL=activities of daily living dependence, I=independent, D=dependent, P=partial
VI=visual impairment, S=some, N=none, SV=severe
HI=hearing impairment, S=some, N=none, SV=severe
MED=number of medications receiving
OBS=organic brain syndrome diagnosis

Raw Data Continued

ID	AGE	RACE	SEX	EDUC	LOR	MOB	ADL	VI	HI	MED	OBS	SPMSQ am	SPMSQ pm
25	79	W	F	16	19m	A	I	S	N	8	N	1.1	1.1
26	78	B	F	2	3m	WC	D	S	N	6	N	5.2	5.2
27	88	B	F	3	4m	A	I	S	S	8	N	1.2	1.2
28	88	W	F	11	4m	WC	D	SV	S	10	N	5	5
29	85	W	M	5	7m	WC	D	SV	S	5	Y	3.2	3.2
30	85	W	F	8	7m	A	I	S	N	4	N	7	7
31	81	W	F	14	3m	WC	D	S	S	11	N	2	3.1
32	84	W	F	9	27m	WC	D	S	N	7	Y	1	1.1
33	84	W	F	16	19m	A	I	S	N	8	Y	7	6.2
34	78	W	F	16	35m	A	D	S	N	8	Y	7	7.1
35	90	W	F	9	40m	A	P	N	S	5	Y	8.2	9
36	81	W	M	8	5m	A	I	SV	S	2	N	2.2	2.2

ID=identification number
EDUC=education in years, NA=not available
LOR=length of residence in months
MOB=mobility status, A=ambulatory, WC=wheelchair
ADL=activities of daily living dependence, I=independent, D=dependent, P=partial
VI=visual impairment, S=some, N=none, SV=severe
HI=hearing impairment, S=some, N=none, Sv=severe
MEDS=number of medications receiving
OBS=organic brain syndrome diagnosis

Raw Data Continued

ID	AGE	RACE	SEX	EDUC	LOR	MOB	ADL	VI	HI	MED	OBS	SPMSQ am	SPMSQ pm
37	70	B	F	10	3m	WC	D	S	N	8	Y	6	7
38	79	B	F	2	19m	A	I	N	N	5	N	6.2	6.2
39	85	B	F	NA	22m	A	D	N	S	6	Y	9	9
40	87	W	F	3	18m	A	I	S	N	6	N	1.1	1
41	81	B	F	2	43m	A	D	N	N	3	Y	8.2	8.2
42	78	W	F	12	3m	WC	D	S	N	3	Y	7.1	7.1
43	74	B	M	2	24m	WC	P	N	N	3	N	5	5.1
44	86	B	F	2	3m	A	I	S	N	2	Y	4	4
45	89	W	F	12	27m	WC	I	S	S	6	N	2.1	1.2
46	85	B	F	NA	4m	WC	D	N	S	6	Y	8	8
47	86	W	M	NA	10m	WC	D	S	S	8	Y	5	5
48	89	W	M	10	8m	A	I	S	SV	0	Y	3.2	3.1

ID=identification number
EDUC=education in years, NA=not available
LOR=length of residence in months
MOB=mobility status, A=ambulatory, WC=wheelchair
ADL=activities of daily living dependence, I=independent
D=dependent, P=partial
VI=visual impairment, S=some, N=none, SV=severe
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MED=number of medications receiving
OBS=organic brain syndrome diagnosis